

REMARKS

Claims 1-8, 13-21 and 23-26 were examined and reported in the Office Action. Claims 1-8, 13-21 and 23-26 are rejected. Claims 1, 5, 13 and 17 are amended. Claims 1-8, 13-21, and 23-26 remain.

Applicant requests reconsideration of the application in view of the following remarks.

I. Drawings

The Office Action states that new corrected drawings in compliance with 37 CFR 1.121(d) are required in this application because the drawings contain handwritten labels which are difficult to read. Formal drawings in compliance are included with this response and approval is respectfully requested.

II. Claim Objections

It is asserted in the Office Action that claims 1-8 and 13-16 are objected to because of informalities. Applicant has amended claims 1, 5, 13 and 17 to overcome the claim objections.

Accordingly, withdrawal of the claim objections for claims 1-8 and 13-16 are respectfully requested.

III. 35 U.S.C. § 103(a)

A. It is asserted in the Office Action that claims 1-8 and 13-16 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over U. S. Patent No. 6,114,739 issued to Theil et al. ("Theil") in view of U.S. Patent Application No. 5,600,486 issued to Gal et al ("Gal") in view of Kato et al (US 2002/0030890), in view of U. S. Patent 5,976,680 issued to Ikemori et al ("Ikemori"). Applicant respectfully traverses the aforementioned rejection for the following reasons.

According to MPEP §2142

[t]o establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation,

either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." (In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)). Further, according to MPEP §2143.03, "[t]o establish prima facie obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. (In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974))." *"All words in a claim must be considered in judging the patentability of that claim against the prior art."* (In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970), emphasis added.)

Applicant's amended claim 1 contains the limitations of

[a]n integrated pixel sensor structure comprising: a set of at least three light sensitive diodes , an i-layer placed on top of the n-layer; a p-layer placed on top of the i-layer; a transparent conductor placed on top of the p-layer; a protective layer coupled to the transparent conductor, a set of separated echelon diffraction grating elements for producing complementary colors and to protect the set of at least three light sensitive diodes, the protective layer disposed between adjacent echelon diffraction grating elements of the set of separated echelon diffraction grating elements, the set of grating elements are placed on top of the transparent conductor, wherein the protective layer is of a sol gel material, the protective layer covers a portion of the transparent conductor not covered by the set of separated echelon diffraction grating elements, and the integrated pixel sensor structure not including a lens.

Applicant's amended claim 5 contains the limitations of

[a] system comprising: an integrated pixel sensor structure having: a set of at least three light sensitive diodes; an i-layer placed on top of the n-layer; a p-layer placed on top of the i-layer; a protective layer coupled to the transparent conductor; and a set of echelon diffraction grating elements for producing complementary colors and to protect the set of at least three light sensitive diodes, the set of echelon diffraction grating elements placed above the transparent conductor, the protective layer disposed between adjacent echelon diffraction grating elements of the set of echelon diffraction grating elements; and a post capture signal processing unit coupled to the integrated pixel sensor, wherein the protective layer is of a sol gel material, the protective layer covers a portion of the transparent conductor not covered by the set of separated echelon diffraction grating elements, and the integrated pixel sensor structure not including a lens.

Applicant's amended claim 13 contains the limitations of

[a] method comprising: providing a set of at least three light sensitive elements, placing an i-layer above the n-layer, placing a p-layer above the i-layer; placing a transparent conductor on top of the p-layer; placing a protective layer of a sol gel material on top of the transparent conductor, and a set of echelon diffraction grating elements for producing complementary colors, the protective layer disposed between adjacent echelon diffraction grating elements of the set of echelon diffraction grating elements, wherein the set of echelon diffraction grating elements to protect the set of at least three light sensitive elements, and the set of echelon diffraction grating elements are placed above the transparent conductor, wherein the protective layer covers a portion of the transparent conductor not covered by the set of echelon diffraction grating elements, and the set of at least three light sensitive elements not including a lens.

Thiel discloses an active pixel sensor with an i-layer formed adjacent to pixel electrodes. A p-layer is formed adjacent to the i-layer. And a transparent electrode is formed adjacent to the p-layer. Thiel, however, does not teach, disclose or suggest

a protective layer coupled to the transparent conductor, ...wherein the protective layer is of a sol gel material, the protective layer covers a portion of the transparent conductor not covered by the set

of separated echelon diffraction grating elements, and the integrated pixel sensor structure not including a lens.

Gal discloses a color separation microlens including color separation grating integrated with the microlens. Gal further discloses the color separation microlens is used for displays. Gal does not teach, disclose or suggest using the grating part of the invention without the lens. Further, Gal does not teach, disclose or suggest using the color separation microlens for a sensor. Moreover, Gal does not teach, disclose or suggest

a protective layer coupled to the transparent conductor, ...wherein the protective layer is of a sol gel material, the protective layer covers a portion of the transparent conductor not covered by the set of separated echelon diffraction grating elements, and the integrated pixel sensor structure not including a lens.

Kato is relied on for teaching the placement of antireflection coatings on a diffractive optical element. It is asserted in the Office Action that the disclosure of Kato in view of Thiel and Gal teach a protective layer above the transparent conductor and between the gratings. Applicant's claimed invention, however, asserts the protective layer is on top of the transparent layer and disposed between adjacent diffraction grating elements. Further, Kato does not teach, disclose or suggest

a protective layer coupled to the transparent conductor, ...wherein the protective layer is of a sol gel material, the protective layer covers a portion of the transparent conductor not covered by the set of separated echelon diffraction grating elements, and the integrated pixel sensor structure not including a lens.

Ikemori is relied on for teaching a non-fogging antireflection film that is made using a sol-gel process. The non-fogging antireflection film has a purpose of preventing reflection and preventing fogging. Nowhere in Ikemori, however, is it taught, disclosed or suggested that the film is scratch resistant. Moreover, Ikemori does not teach, disclose or suggest

a protective layer coupled to the transparent conductor, ...wherein the protective layer is of a sol gel material, the protective layer covers a portion of the transparent conductor not covered by the set of separated echelon diffraction grating elements, and the integrated pixel sensor structure not including a lens.

Therefore, neither Theil, Gal, Kato, Ikemori, and therefore, nor the combination of the four, teach, disclose or suggest the limitations contained in Applicant's amended claims 1, 5 and 13, as listed above. Since neither Theil, Gal, Kato, Ikemori, nor the combination of the four, teach, disclose or suggest all the limitations of Applicant's amended claims 1, 5 and 13, Applicant's amended claims 1, 5 and 13 are not obvious over Theil in view of Gal, Kato and Ikemori since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claims 1, 5 and 13, namely claims 2-4, 6- 8, and 14-16, respectively, would also not be obvious over Theil in view of Gal, Kato and Ikemori for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 1-8 and 13-16 are respectfully requested.

B. It is asserted in the Office Action that claims 17-21, and 23-26 are rejected in the Office Action under 35 U.S.C. § 103(a), as being unpatentable over Thiel in view of U.S. Patent Application No. 5,760,834 issued to Rostoker et al (“Rostoker”), in further view of Ikemori. Applicant respectfully traverses the aforementioned rejection for the following reasons.

Applicant's amended claim 17 contains the limitations of

[a]n integrated circuit die comprising: an image sensing area of the die having at least three light-sensitive diodes formed above a metalization layer of the die; and a protective layer of the die, wherein the protective layer is to protect each of the at least three diodes and a plurality of echelon diffraction gratings placed on top of a transparent conductor layer, the transparent conductor forms a top contact of the at least three light sensitive diodes and wherein the protective layer has a low enough deposition temperature so as not to environmentally stress the transparent conductor, and the protective layer covers a portion of the transparent layer not covered by the plurality of echelon diffraction gratings, wherein the protective layer is of a sol gel material, and the set of at least three light sensitive diodes not including a lens.

Thiel discloses an active pixel sensor with an i-layer formed adjacent to pixel electrodes. A p-layer is formed adjacent to the i-layer. And, a transparent electrode is formed adjacent to the p-layer. Each sensor in Thiel only discloses one electrode. That is, each sensor is a single diode. Thiel, does not teach, disclose or suggest

[a]n integrated circuit die comprising: an image sensing area of the die having at least three light-sensitive diodes formed above a metalization layer of the die; ... wherein the protective layer has a low enough deposition temperature so as not to environmentally stress the transparent conductor, and the protective layer covers a portion of the transparent layer not covered by the plurality of echelon diffraction gratings, wherein the protective layer is of a sol gel material, and the set of at least three light sensitive diodes not including a lens.

Rostoker discloses an electronic camera having a photosensor array. It is asserted in the Office Action that Rostoker discloses a “diffraction grating element” and asserts reference 1610 of Fig. 16B. Reference 1610, however, is referred to in Rostoker as element 788 in Figure 7. Reference 788 is referred to as reference numbers 108, 308, 408 and 508, which are lenses or lenslets. (See Rostoker, column 9, lines 60-66). Rostoker does not teach, disclose or suggest echelon diffraction gratings. Further, Rostoker does not teach, disclose or suggest

[a]n integrated circuit die comprising: an image sensing area of the die having at least three light-sensitive diodes formed above a metalization layer of the die; ... wherein the protective layer has a low enough deposition temperature so as not to environmentally stress the transparent conductor, and the protective layer covers a portion of the transparent layer not covered by the plurality of echelon diffraction gratings, wherein the protective layer is of a sol gel material, and the set of at least three light sensitive diodes not including a lens.

Ikemori is relied on for teaching a non-fogging antireflection film that is made using a sol-gel process. Ikemori, however, does not teach, disclose or suggest

[a]n integrated circuit die comprising: an image sensing area of the die having at least three light-sensitive diodes formed above a metalization layer of the die; ... wherein the protective layer has a low enough deposition temperature so as not to environmentally stress the transparent conductor, and the protective layer covers a

portion of the transparent layer not covered by the plurality of echelon diffraction gratings, wherein the protective layer is of a sol gel material, and the set of at least three light sensitive diodes not including a lens.

Therefore, neither Theil, Rostoker, Ikemori, and therefore, nor the combination of the three, teach, disclose or suggest the limitations contained in Applicant's amended claim 17, as listed above. Since neither Theil, Rostoker, Ikemori, nor the combination of the three, teach, disclose or suggest all the limitations of Applicant's amended claim 17, Applicant's amended claim 17 is not obvious over Theil in view of Rostoker and Ikemori since a *prima facie* case of obviousness has not been met under MPEP §2142. Additionally, the claims that directly or indirectly depend from amended claim 17, namely claims 18-21 and 23-26, would also not be obvious over Theil in view of Rostoker and Ikemori for the same reason.

Accordingly, withdrawal of the 35 U.S.C. § 103(a) rejections for claims 17-21 and 23-26 are respectfully requested.

CONCLUSION

In view of the foregoing, it is submitted that claims 1-8, 13-21 and 23-26 patentably define the subject invention over the cited references of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§1.16 or 1.17, particularly, extension of time fees.

Respectfully submitted,

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Jean Svoboda

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